CLAIMS

1. Hall-effect plasma thruster having a longitudinal axis OO' substantially parallel to a thrust direction defining an upstream portion and a downstream portion, and comprising :

- a primary ionization and acceleration channel (3) made of a refractory material surround by two circular cylindrical poles (63, 64), the annular channel (3) being open at its upstream end,

- an annular gas-dispensing anode (1) receiving gas from gas-distribution lines and equipped with passages for admitting this gas into the annular channel (3), said annular anode (1) being placed inside of the channel (3) in an upstream portion of said channel (3),

- at least one hollow cathode (2) arranged outside the annular channel (3), adjacent thereto,

- a magnetic circuit (40) comprising upstream polar ends (49, 48) for creating a radial magnetic field in an upstream portion of the annular channel (3) between these polar parts (49, 48), said circuit (40) consisting of a downstream plate (4), from which protrude, upstream and parallel to the axis OO', a central arm (41) situated at the center of the annular channel (3), two circular cylindrical poles (63, 64) on both sides of the annular channel (3), and peripheral arms (42) situated on the exterior of the annular channel (3) and adjacent thereto, plasma thruster characterized in that at least one of the arms (42',

41') of the magnetic circuit (40) comprises a permanent magnet (54, 55).

2. Plasma thruster as claimed in Claim 1, characterized in that a portion of the arms (41', 42') of the magnetic circuit (40) comprises a permanent magnet (55, 54) and in that another portion of the arms (41', 42') of the magnetic circuit (40) does not comprise permanent magnets.

3. Plasma thruster as claimed in one of Claims 1 or 2, characterized in that each arm (41', 42') of the magnetic circuit (40) comprising a permanent magnet (55, 54) consists of a downstream portion (43, 44) in contact with the downstream plate (4), an upstream portion (45, 46) holding a magnetic pole (49, 48) and a central portion adjacent to the downstream portion (43, 44) and to the upstream portion (45, 46) consisting of said permanent magnet (55, 54).

4. Plasma thruster as claimed in Claim 3, characterized in that a jacket (47) is present on each arm (41', 42') of the magnetic circuit (40) comprising a permanent magnet (55, 54).

5. Plasma thruster as claimed in one of Claims 1 to 4, characterized in that a field coil (51, 52) is wound around arms (42, 41) not comprising permanent magnets.

6. Plasma thruster as claimed in one of Claims 1 to 5, characterized in that no field coil is engaged around the arms (41', 42') of the magnetic circuit (40) comprising a permanent magnet (55, 54).

7. Plasma thruster as claimed in one of Claims 1 to 5, characterized in that the peripheral arms (42, 42') are arranged in rotational symmetry around the axis OO'.

8. Plasma thruster as claimed in Claim 1, characterized in that the peripheral arms (42') each comprise a permanent magnet (54), in that the central arm (41) is made of a magnetic material only and in that a field coil (51) is engaged around said central arm (41).

9. Plasma thruster as claimed in Claim 1, characterized in that the central arm (41') comprises a permanent magnet (55), in that the peripheral arms (42) are made of a magnetic material only, and in that a field coil (51) is engaged around said central arm (41).

10. Plasma thruster as claimed in Claim 1, characterized in that the central arm (41') comprises a permanent magnet (55), and in that all of the peripheral arms (42') comprise a permanent magnet (54).